# Exhibit 2

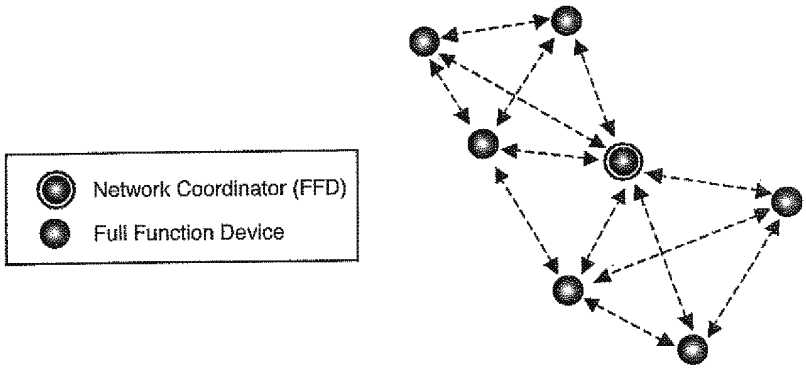


**Figure 5–2: Peer-to-peer network topology**

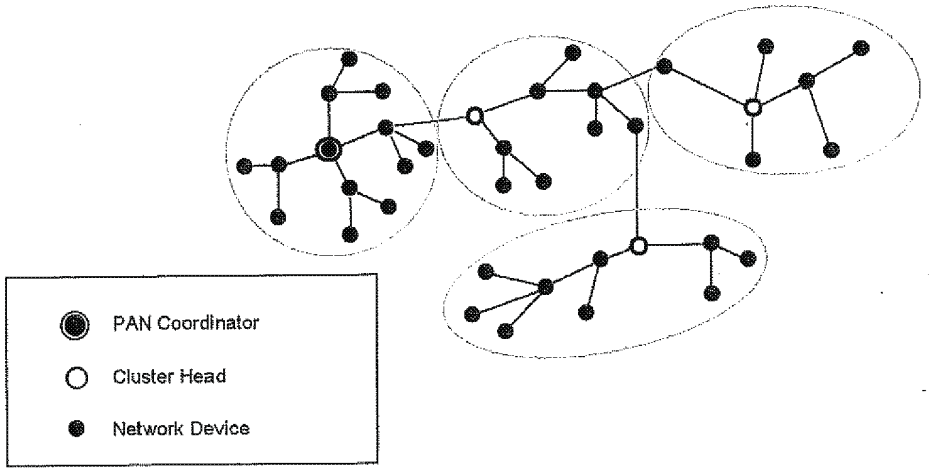


**Figure 5–3: Cluster-tree network topology**

## SUPERFRAME STRUCTURE

IEEE Std 802.15.4 allows the implementation of an optional superframe structure. The superframe is managed by the PAN coordinator and is bounded by beacon messages sent by the PAN coordinator at programmable regular intervals. Each beacon contains information that will help network devices synchronize to the network; this information includes the network identifier, beacon periodicity, and superframe structure. A superframe is divided in 16 contiguous time slots; the first time slot starts at the end of the beacon frame.

Network devices that wish to communicate with the PAN coordinator must attempt to do it in the time between two successive beacons. This period of time is called the contention access period (CAP). To communicate with the PAN coordinator, each network device needs to access the channel using CSMA-CA. Figure 5–4 shows the generic structure of a superframe.


**Figure 5–4: Generic superframe structure**

Each GTS is formed by an integer multiple of time slots. Each time slot is equal to 1/16 of the time between the start of two successive beacons.

The PAN coordinator can assign dedicated portions of the superframe to a specific network device requesting it. These segments of time are called guaranteed time slots (GTSs). This capability supports applications with a particular bandwidth requirement or needing lower communications latency. GTSs are all grouped toward the end of the superframe as is illustrated in Figure 5–5. The length of time covering all GTSs is defined as the contention-free period (CFP).

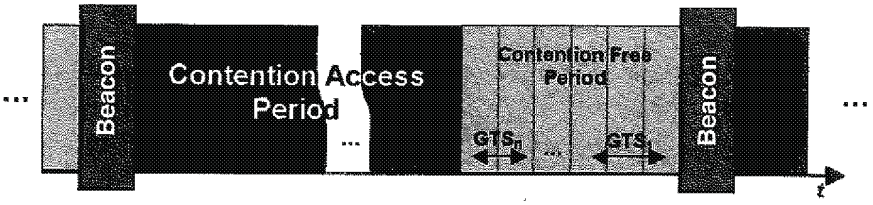


**Figure 5–5: Superframe structure with GTS**

## MAC Data Transfer Model

The nature of the radio-frequency spectrum offers several challenges to the wireless communication system designer. The IEEE Std 802.15.4 MAC was designed to take these challenges into account and provide measures to improve communications reliability by offering a fully acknowledged protocol using CSMA-CA and a frame integrity check.